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Author(s)	KUWAYAMA, Satoru
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FURTHER STUDIES ON THE NEUROPTERA-
PLANIPPENNIA OF THE KURILE ISLANDS

By SATORU KUWAYAMA

Hokkaido National Agr. Exp. Sta., Kotoni, Sapporo

In 1936 I reported on the neuropterous fauna of the Kurile Islands, enumerating 9 species of the Planipennia. While, in the summer of 1940, I had a chance to travel the South Kuriles, namely Shikotan, Kunashir and Yutorup Islands, and collected very many insect specimens, including a certain proportion of the Neuroptera-Planipennia. After closer examination on these collections, I found some additional species and also the necessity for revising the previous identifications on some species. In the following lines the species examined are enumerated. Of them two species are apparently new to science and are described herewith. The type specimens are deposited with the collection of the Entomological Laboratory, Hokkaido University.

My thanks are due to Prof. TOICHI UCHIDA for his kind permission to examine the university collection and also to Dr. WARO NAKAHARA for his helpful suggestions.

Familia I HEMEROBIIDAE

1. *Hemerobius japonicus* NAKAHARA

Hemerobius japonicus NAKAHARA, Ann. Zool. Jap., IX, p. 25 (1915); NAKAHARA, Kontyu, XXI, p. 41 (1954).

Locality: Kunashir I. (Seseki, 1 ♀, 15·VIII·1940, S. KUWAYAMA and Y. SUGIHARA).

Distribution: Kuriles, Hokkaido (new record), Honshu, Shikoku, Kyushu.

Remarks: This is a newly added species to the fauna of the Kuriles.

2. *Hemerobius shikotanus* sp. nov. (Fig. 1)

Hemerobius humuli KUWAYAMA, nec LINNÉ, Ins. Mats., X, p. 109 (1936).

Head shining yellowish; genae and sides of clypeus dark brown. Palpi testaceous, the distal segments being tinged with fuscous. Antennae yellowish, becoming dark testaceous at the apices. Epicranium suffused with brown at the sides.

Prothorax testaceous, broadly bordered with dark brown, with long yellowish hairs rather densely; lateral projections pale. Meso- and metathorax dark brown, with a broad longitudinal median dorsal band of pale yellow. Legs mostly yellowish; the fifth segments of tarsi brown.

Forewing oval; membrane transparent grey, somewhat darker along the margins. On the disc the markings are in the form of well-separated but faint sagittate spots. A small but distinct blackish brown spot at the basal cross-vein

connecting Cu_1 and M_{3+4} . Longitudinal veins and costal veinlets pale, the former being variegated with blackish brown spots and short lines, the most distinct markings at the fork-points. Cross-veins, especially gradate cross-veins, dark fuscous. Three branches to R_s as usual, but the inner cross-vein between R_1 and the third branch is far before the second fork of the latter (R_c).

Hindwing transparent pale grey, the costal margin greyish brown and somewhat clouded with grey at the apex and along the inner margin; pterostigma darker. Longitudinal veins pale, somewhat darker at the apical parts; gradate cross-veins dark brown.

Abdomen wholly fuscous, with long greyish hairs sparsely. Lobes of the ninth sternite in the female rather broadly rounded.

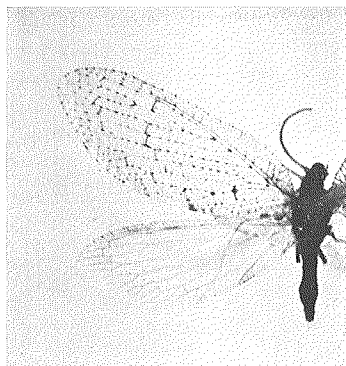


Fig. 1.

Hemerobius shikotanus sp. nov.

Holotype (ca $\times 4$)

Length of body 5.0 mm., of forewing 8.5 mm., of hindwing 7.0 mm., width of forewing 3.5 mm.

Locality: Shikotan I. (Shakotan, 1 ♀, Holotype, 23-27.VI.1935, Y. SUGIHARA).

Distribution: Kuriles.

Remarks: This species resembles so closely *Hemerobius humulinus* LINNÉ, *H. obtusus* NAKAHARA and *H. japonicus* NAKAHARA at a glance that I erroneously misidentified it with *H. humulinus* in my previous paper. However, the position of the inner cross-vein between R_1 and the third branch in the forewing is quite different; in this point this species is somewhat allied to *H. contumax* TJEDER of Europe.

3. *Eumicromus paganus* LINNÉ

Hemerobius paganus LINNÉ, Syst. Nat., ed XII, 1, p. 912 (1767).

Micromus paganus NAVÁS, Ark. Zool., XVIII B, 2, p. 3 (1925).

Stenomicromus paganus KRÜGER, Stett. ent. Zeit., LXXX, p. 171 (1922).

Eumicromus paganus KILLINGTON, Mon. Brit. Neur., I, p. 264 (1936).

Eumicromus alpinus KUWAYAMA in part, nec NAKAHARA, Ins. Mats., X, p. 109 (1936).

Locality: Kunashir I. (Nikishiro, 1 ♀, 17-22.VII.1935, T. UCHIDA).

Distribution: Kuriles, Kamchatka, Europe.

Remarks: The Kuriles is a new locality to this species.

4. *Eumicromus alpinus* NAKAHARA

Eumicromus alpinus NAKAHARA, Ann. Zool. Jap., IX, p. 41 (1915); KUWAYAMA, Ins. Mats., X, p. 109 (1936); KUWAYAMA, Ins. Mats., XVIII, p. 96 (1954).

Locality: Paramushir I. (Murakami-wan, 2 ♂♂, 2.VIII.1926, K. DOI).

Distribution: Kuriles, Saghalien, Hokkaido, Honshu.

Remarks: This species is closely allied to the former species, *E. paganus*, but can be easily distinguished by the markings of wings.

Familia II OSMYLIDAE

5. *Osmylus tessellatus* MACLACHLAN

Osmylus tessellatus MACLACHLAN, Trans. Ent. Soc. Lond., 1875-II, p. 180 (1875); KUWAYAMA, Ins. Mats., X, p. 108 (1936).

Locality: Kunashir I. (Maruyama, 1 ♀, 26-VII-1935, T. UCHIDA).

Distribution: Kuriles, Hokkaido, Honshu, Shikoku, Kyushu.

6. *Plethosmylus hyalinatus* MACLACHLAN

Osmylus hyalinatus MACLACHLAN, Trans. Ent. Soc. Lond., 1875-II, p. 181 (1875).

Plethosmylus hyalinatus KRÜGER, Stett. ent. Zeit., LXXIV, p. 274 (1913); KUWAYAMA, Ins. Mats., X, p. 109 (1936).

Locality: Kunashir I. (Nikishiro, 1 ♂, 11-VIII-1925, K. DOI; Maruyama, 1 ♂ 1 ♀, 26-VII-1935, T. UCHIDA; Seseiki, 1 ♀, 15-VIII-1940, S. KUWAYAMA and Y. SUGIHARA).

Distribution: Kuriles, Saghalien, Hokkaido, Honshu, Shikoku, Kyushu.

7. *Lymsus harmandinus* NAVÁS

Osmylus harmandinus NAVÁS, Ann. Soc. Sci. Brux., 1910, p. 190 (1910).

Lymsus Harmandinus NAVÁS, Rev. Russ. d'Entom., XI, p. 113 (1910).

Eosmylus ?? *Harmandinus* KRÜGER, Stett. ent. Zeit., LXXVI, p. 74 (1915).

Eosmylus harmandinus KUWAYAMA, Ins. Mats., X, p. 108 (1936).

Locality: Shikotan I. (Chiboi, 2 ♂ ♂, 27-VII-1940, S. KUWAYAMA and Y. SUGIHARA); Kunashir I. (Seseiki, 1 ♂ 1 ♀, 27-28-VII-1935, T. UCHIDA; Nikishiro, 1 ♀, 17-22-VII-1935, T. UCHIDA; Fushikokotan, 1 ♀, 7-VIII-1925, K. DOI; Yam-betsu, 1 ♂ 1 ♀, 22-25-VII-1935, T. UCHIDA; Chinomiji, 8 ♂ ♂ 5 ♀ ♀, 5-6-VIII-1940, S. KUWAYAMA and Y. SUGIHARA; Pondomari, 3 ♂ ♂, 9-10-VIII-1940, S. KUWAYAMA and Y. SUGIHARA; Uennai, 5 ♀ ♀, 11-12-VIII-1940, S. KUWAYAMA and Y. SUGIHARA; Furukamappu, 2 ♂ ♂ 1 ♀, 15-VIII-1940, S. KUWAYAMA and Y. SUGIHARA; Tōfutsu, 1 ♂, 17-18-VIII-1940, S. KUWAYAMA and Y. SUGIHARA; Tōfutsu-Kotankeshi, 3 ♀ ♀, 18-VIII-1940, S. KUWAYAMA and Y. SUGIHARA); Yetorup I. (Toshimoe, 1 ♀, 29-30-VIII-1940, S. KUWAYAMA and Y. SUGIHARA).

Distribution: Kuriles, Saghalien, Hokkaido, Honshu, Shikoku, Kyushu.

Remarks: This species is widely distributed over the South Kuriles, and very common in the Kunashir Island. Among the 37 specimens examined, I found 5 specimens with no basal sigmoid cross-vein in hindwing, as well as some specimens with very faint one. Of the total specimens of the Kuriles which I have seen 18 are males and 19 are females, 3 males and 2 females are absent the sigmoid cross-vein. It may be, as these figures suggest, that the presence or absence of this cross-vein is not sexual, and also may be looked upon as an

aberrant variation. In 1955, NAKAHARA created the genus *Neolysmus* on the ground that from the genus *Lysmus* "it can be distinguished only by the greatly reduced number of discal cross-veins in forewing and by the absence of the sigmoid cross-vein in hindwing". In regard to adopting the sigmoid cross-vein as a generic character more precise studies are desirable.

8. *Lysmus kurilensis* sp. nov. (Fig. 2)

Heliosmylus flavicornis KUWAYAMA, nec MACLACHLAN, Ins. Mats., X, p. 109 (1936).

Head shining yellowish, much swollen above, with blackish and yellowish long hairs; a dark fuscous marking at the middle of postclypeus; 4 testaceous stripes on the vertex; occiput testaceous. Palpi yellowish. Antennae yellowish, somewhat brownish towards the tips.

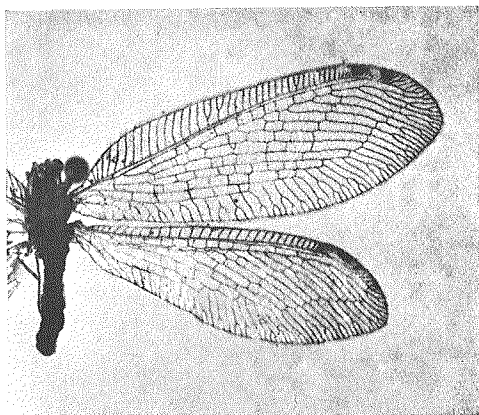


Fig. 2. *Lysmus kurilensis* sp. nov.

Holotype (ca $\times 3$)

Pronotum yellowish, without conspicuous markings; provided with numerous black or pale hairs on both sides. Meso- and metathorax brownish, with a broad median longitudinal band which is ochreous; strong black hairs on the anterior margin of mesoscutum. Legs testaceous, suffused with brownish at the end of tibia and tarsi; claws shiny brown, strongly curved.

Forewing broad, subacute at the apex, vitreous; neuration mostly brownish, partly pale; subcosta and radius rather yellowish; no markings, while two or three cubital cross-veins bordered narrowly with brownish grey. Pterostigma yellowish white with some thickened dark brownish veins on both sides. Costal cross-veins simple, though the two or three near the middle are furcate; radial sector with 8-9 branches; inner and outer gradate cross-veins diverge towards the costal margin.

Hindwing transparent as in forewing; without markings, except at ptero-

stigma which is similarly marked as in forewing; neuration mostly pale, but partly brownish, especially the costal cross-veins. The basal sigmoid cross-vein between radius and media present; discal cross-veins very few; gradate cross-veins diverge toward the costal margin.

Abdomen dark brown, partly dark yellowish, sparingly clothed with pale hairs; more yellowish toward the apex. In male the ninth tergite is very short and transverse, while the tenth tergite is divided mid-dorsally to form latero-dorsal plates which carry each large dome-like swelling provided with many trichobothria. The tenth sternite rather short but broad, with rounded margin.

Length of body 8.5 mm., of forewing 17.0 mm., of hindwing 14.0 mm., width of forewing 6.0 mm.

Locality: Yetorup I. (Shana, 1 ♂, Holotype, 10-20-VI-1935, Y. SUGIHARA).

Distribution: Kuriles.

Remarks: This species resembles *Lysmus harmandinus* NAVÁS, but both species can easily be distinguished by the markings of head and prothorax and the features of both wings.

Familia III CHRYSOPIDAE

9. *Chrysopa vittata* WESMAEL

Chrysopa vittata WESMAEL, Bul. Acad. Brux., VIII, p. 211 (1841); KILLINGTON, Mon. Brit. Neur., II, p. 163 (1937).

Nineta vittata NAVÁS, Ark. Inst. Cienc., 1915, p. 87 (1915); NAVÁS, Ark. Zool., XVIII B, 2, p. 1 (1925); KUWAYAMA, Ins. Mats., X, p. 108 (1936).

Locality: Shikotan I. (Shakotan, 1 ♀, 5-VII-1925, K. DOI); Kunashir I. (Maruyama, 2 ♂♂, 26-VII-1935, T. UCHIDA); Yetorup I. (Rubetsu, 3 ♀♀, 23-31, VIII-1940, S. KUWAYAMA and Y. SUGIHARA; Toshimoe, 1 ♀, 30-VIII-1940, S. KUWAYAMA and Y. SUGIHARA); Urup I. (Tokotan, 1 ♀, 1-IX-1927, K. DOI).

Distribution: Kuriles, Kamtchatka, Saghalien, Siberia, Europe, Hokkaido, Honshu, Shikoku.

10. *Chrysopa intima* MACLACHLAN

Chrysopa intima MACLACHLAN, Trans. Ent. Soc. Lond., 1893, p. 230 (1893); KUWAYAMA, Ins. Mats., X, p. 108 (1936).

Locality: Kunashir I. (Pondomari, 1 ♂, 10-VIII-1940, S. KUWAYAMA and Y. SUGIHARA; Furukamappu, 1 ♂ 1 ♀, 15-VIII-1940, S. KUWAYAMA and Y. SUGIHARA; Seseki, 1 ♂, 15-VIII-1940, S. KUWAYAMA and Y. SUGIHARA; Kotankeshi, 1 ♂ 1 ♀, 18-19-VIII-1940, S. KUWAYAMA and Y. SUGIHARA); Yetorup I. (Shana, 1 ♂ 2 ♀♀, 10-20-VII-1935, Y. SUGIHARA).

Distribution: Kuriles, Saghalien, Siberia, Hokkaido, Honshu.

Remarks: NAVÁS recorded in 1925 the distribution of *Chrysopa perla* LINNÉ in Kamtchatka. This species is closely related one to *Ch. intima*.

11. *Chrysopa sapporensis* OKAMOTO

Chrysopa sapporensis OKAMOTO, Jour. Coll. Agr., Tohoku Imp. Univ., VI,

p. 60 (1914).

Locality: Yetorup I. (Bettobi, 1 ♂, 4-IX-1940, S. KUWAYAMA and Y. SUGIHARA).

Distribution: Kuriles, Hokkaido, Honshu.

Remarks: This is the first record on the distribution of the present species to the Kuriles.

12. *Chrysopa sachalinensis* MATSUMURA

Chrysopa sachalinensis MATSUMURA, Jour. Coll. Agr., Tohoku. Imp. Univ., IV., p. 14 (1911).

Locality: Shikotan I. (Shakotan, 5 ♂ ♂ 7 ♀ ♀, 25-26-VII-1940, S. KUWAYAMA and Y. SUGIHARA; Chiboi, 1 ♀, 27-VII-1940, S. KUWAYAMA and Y. SUGIHARA; Notoro, 4 ♂ ♂ 2 ♀ ♀, 31-VII-1940, S. KUWAYAMA and Y. SUGIHARA).

Distribution: Kuriles, Saghalien, Hokkaido, Honshu.

Remarks: New to the fauna of the Kuriles. This species is closely related to *Chrysopa ventralis* CURTIS which is widely distributed over Europe, Algeria and Siberia; especially it is allied to subsp. *prasina* BURMEISTER. As a slight difference is observable in the features of wings, the determination of constituting the two as one species will be made by future investigation.

Familia IV MYRMELEONTIDAE

13. *Myrmeleon formicarius* LINNÉ

Myrmeleon formicarius LINNÉ, Syst. Nat., ed XII, p. 914 (1767); KUWAYAMA, Ins. Mats., X, p. 107 (1936).

Locality: Kunashir I. (Fushikokotan, 1 ♂, 7-VIII-1925, K. DOI).

Distribution: Kuriles, Saghalien, Siberia, Europe, China, Korea, Hokkaido, Honshu, Shikoku, Kyushu, Loo-choo, Formosa.